

## CONTENT

### **REVIEW ARTICLE**

#### **Chemistry of Fullerene and It's Application: a Review**

*SN Pandeya, Neelottama Maurya, AK Pathak and Swatantra KS Kushwaha.....234*

#### **ABSTRACT:**

The discovery of fullerenes has opened a new chapter on the physics and chemistry of carbon. So far, the physical and chemical properties of fullerenes are still under investigation. More research is needed to be done to confirm the suitability of some important application. Some potential applications will need more time for them to become reality. Their unique carbon cage structure coupled with immense scope for derivatization makes fullerenes a potential therapeutic agent. Henceforth chemistry and various potential therapeutic applications of fullerenes have been reviewed in the present paper. These include anti HIV- protease activity, photodynamic DNA cleavage, free radical scavenger, antimicrobial action and use of fullerenes as diagnostic agents.

**KEYWORDS:** Fullerenes, anti-HIV agent, antibacterial agent, DNA photo cleavage, anti-oxidant.

#### **Biochemical Role of Cytochrome P450 Enzymes In-Vivo**

*Yatri R Shah, Dhruvo Jyoti Sen and CN Patel.....243*

#### **ABSTRACT:**

CYP450 exists in prokaryotic and eukaryotic (plants, insects, fish and mammal, as well as microorganism). Different P450 enzymes can be found in almost any tissue: liver, kidney, lungs and even brain. It plays an important role in drugs metabolism and xenobiotics. Cytochrome P450 proteins in humans are drug metabolizing enzymes and enzymes that are used to make cholesterol, steroids and other important lipids such as prostacyclins and thromboxane-A<sub>2</sub>. Firstly CYP450 is discovered by R.T. Williams - in vivo, 1947. Brodie – in vitro, from late 40s till the 60s. Cytochrome P450 enzymes (hemoproteins) play an important role in the intra-cellular metabolism CYP enzymes have been identified from all lineages of life, including mammals, birds, fish, insects, worms, sea squirts, sea urchins, plants, fungi, slime molds, bacteria and archaea. More than 8100 distinct CYP sequences are known. CYP450 includes hydroxylation and various xenobiotic reactions. Clinical aspects of CYP450 include genetic polymorphism and drug drug interaction. Roche Amplichip test is very useful nowadays because many harmful reactions resulting from inappropriate dosing and treatment may be significantly reduced as clinicians can adjust the patient's regimen accordingly. The AmpliChip Cytochrome P450 Genotyping System may help the doctor determine if a patient is at risk of adverse drug reactions or sub-optimal drug response. Thus it is very up growing technique to prevent adverse drug reactions.

#### **Combinatorial Chemistry: A New Approach for Drug Discovery**

*Parimal M Prajapati, Yatri Shah, DJ Sen and CN Patel.....249*

#### **ABSTRACT:**

Combinatorial chemistry is a technology for creating a multitude of different compounds by reacting different combinations of interchangeable chemical "building blocks." The compounds are then screened for their ability to

carry out a specified function, most commonly to act as drugs to treat a disease. Combinatorial chemistry allows the rapid synthesis and testing of many related compounds, greatly speeding the pace of drug discovery. Combinatorial chemistry is a method for reacting a small number of chemicals to produce simultaneously a very large number of compounds, called libraries, which are screened to identify useful products such as drug candidates. combinatorial chemistry can be explained simply, its application can take a variety of forms, each requiring a complex interplay of classical organic synthesis techniques, rational drug design strategies, robotics, and scientific information management. Combinatorial technologies offer significant advances over traditional scientific research methodologies. In particular, their high-speed approach promises faster results at considerably lower costs than conventional techniques. combinatorial chemistry libraries requires an application that understands the science behind combinatorial chemistry while managing the chemical and biological data generated by combinatorial chemistry programs.

---

### **Vitamins, Minerals and Carotenoids as a Antioxidants**

*Vijay K Patel, Chirag Kpatel, Harsha U Patel and CN Patel.....255*

---

#### **ABSTRACT:**

Antioxidants neutralize free radicals. Free radicals are molecules in our body that are missing an electron. They steal electrons from healthy cells destroying them in the process called oxidation. Your body is constantly trying to oxidize, but antioxidants keep you fresh and healthy. It prevents the formation of free radicals, such as transferrin, SOD, carotenoids. It neutralise those that are formed, thus inhibiting chain-breaking processes, such as, the vitamins A, E and C. Also it repair the damage caused by free radicals, such as the DNA repair enzymes, e.g. transferase. Natural antioxidants are synthesised by plants and are present in the foods we eat, as opposed to those synthetic antioxidants that are either added to food to extend its shelf-life (e.g. BHT), or prepared by extraction from plant sources to be taken as supplements in concentrated form.

**KEYWORDS:** Free radicals, SOD, Shelf life, BHT

---

### **Drug Design: An Emerging Era of Modern Pharmaceutical Medicines.**

*Sapkale GN, Khandare DD, Patil SM and Ulhas S Surwase.....261*

---

#### **ABSTRACT:**

The term drug design represents mainly to develop new drug, manipulate and/ or representation of three-dimensional structure of the molecule and association of physico-chemical properties. A drug has become a valuable and essential tool to medicinal chemists for development of new drugs. Different techniques of drug designing that extend from simply visualizing a small drug molecule on computers for computing the intricate of drug targets interactions on a super computer. Computerized drug designing provides medicinal chemist with information regarding three dimensional structure of molecule, chemical and physical characteristics of a molecule, comparing the structures of drug molecules for visualization of complex formed, prediction about how new related molecules look. Based on these fundamentals we try to explain drug design concept and its need related to pharmaceutical medicines.

**KEYWORDS:** Drug design, CADD, Complex, QSAR, Molecular modeling.

---

### **A Review on Biological Profile of Pyridazinone Containing Drugs**

*Alok Singh Thakur, Parmanand Verma and Anish Chandy,.....265*

---

#### **ABSTRACT:**

Pyridazinone nucleus exhibited immense pharmacological activities. The simple pyridazinone nucleus is present in compounds are evaluating for new products that possess some remarkable pharmacological activities, such as anti-inflammatory, cardiogenic, antihypertensive, analgesic, anti-platelet aggregation, vasodilatory, antidiabetic, anticonvulsant. The present review focuses on pyridazinones which possess potential activities that are new in development.

**KEYWORDS:** pyridazinone, anti-platelet, vasodialatory, anti-inflammatory.

---

### Development of New Anti Inflammatory Drugs

*Vishal S Thakar, Chirag K Patel, HU Patel and CN Patel.....272*

---

#### ABSTRACT:

Approximately 50NSAID preparations are listed in Monthly Index of Medical Specialties and, as a class, these are among the most commonly prescribed drugs. NSAIDs are sometimes known as the aspirin-like drugs because they have an activity profile that is broadly similar to that of aspirin. That is, they all possess analgesic, anti-inflammatory and ANTIPYRETIC properties to some degree, and produce characteristic side effects, including gastric intolerance and depression of blood clotting through inhibitory action on platelet function. Two closely related forms of the cyclooxygenase have been identified which are now known as COX-1 and COX-2. Both isoenzymes transform arachidonic acid to prostaglandins, but differ in their distribution and their physiological roles. Meanwhile, the responsible genes and their regulation have been clarified. COX-1, the pre-dominantly constitutive form of the enzyme, is expressed throughout the body and performs a number of homeostatic functions such as maintaining normal gastric mucosa and influencing renal blood flow. COX-1 and COX-2 at standard anti-inflammatory doses. Simmons also recently co-discovered COX-3 in 2002 and analyzed this new isozyme's relation to acetaminophen (paracetamol), arguably the most widely used analgesic drug in the world. The clinical ramifications and knowledge of COX isozymes are therefore rapidly expanding and could perhaps offer significant hope for future treatments of pain, inflammation and fever.

**KEYWORDS:** Liquid chromatography- mass spectrometry Valsartan

---

### New Emerging Targets for Obesity

*Prashant S Mewada, Chirag K Patel, CS Rami, HU Patel and CN Patel.....278*

---

#### ABSTRACT:

The increasing prevalence of obesity worldwide has prompted the world health organization (WHO) to classify it as a global epidemic. A round the globe, more than a half a billion people are overweight, and the chronic disease of obesity represents a major threat to health care system in developed and developing countries. Energy homeostasis is accomplished through a highly integrated and reductant neurohumoral system. Adrenergic and serotonergic agents enjoyed before is now disfavored due to abuse and lack of exact receptor subtype profile respectively.  $\beta_3$ -adrenergic receptor agonist acting, as thermogenic agents are new approach and its value will become apparent once data are available from relevant clinical evaluation some drug from this class are under clinical trials. Transgenic technology has provided new opportunities to modify the complex body weight regulation system and to assess the relative importance of the individual components. Certain peptides have been used successfully as antiobesity agents. They reduced gastrointestinal absorption and affect feeding behavior. Since obesity result from genetic predisposition, combined with the proactive environment situation, we discuss new potential targets for generation of drugs that may help people in gaining control over appetite as well as increase total energy expenditure and fat oxidation.

---

### Dimethyl Carbonate: Environmentally Benign Reagent for Pharmaceutical Synthesis

*Kumbhoje SR, Sonone SB, Naikwade NS and Ravetkar AS.....288*

---

#### ABSTRACT:

An important source of global pollution is the chemicals manufacturing industry. Many of the steps involved in the synthesis of pharmaceuticals and fine chemicals are based on reactions and reactants developed many decades ago when environmental concerns were absent. A large number of these reactions are based on the use of stoichiometric amounts of reagents producing most of the hazardous byproducts. Dimethyl carbonate is a unique molecule with versatile chemical reactivity. Dimethyl carbonate and other dialkyl carbonates offer powerful perspectives for the development of alkylation/carboxyalkylation methods in the pharmaceutical synthesis. It is an environmentally benign building block because of its cheap commercial availability and high ecological safety profile; it possesses interesting solvating properties, low toxicity, and is highly biodegradable.

**KEYWORDS:** Dimethyl carbonate, Environmentally benign reagent, Biodegradable, Carbonate.

---

## RESEARCH ARTICLE

### Synthesis and Analgesic Activity of 2, 5 Di-Substituted 1, 3, 4 Oxadiazoles

Rakesh Saini, Saurabh Chaturvedi, AN Kesari, Rijuved Garg and Amita Verma.....292

---

#### ABSTRACT:

1, 2, 3 benzotriazole derivative also show several pharmacological activities viz.example. Antimicrobial activity, Anti inflammatory, Anti analgesic activity, Anticancer etc. On the basis of our observation the parent research work was carried out to synthesize 1, 2, 3 triazole substituted 1, 3, 4 oxadiazoles and to further evaluate Analgesic activity. Synthesis of (ethyl 2- (1H Benzo [d] [1, 2, 3] triazole -1- yl] acetate) and (2H - benzo [d] [1,2,3] triazole - 1 - yl aceto hydrazine) along with their derivatives has been done. The entire synthesized compounds were characterized by UV, IR and <sup>1</sup>H-NMR specteoscropy. The Antimicrobial activity of the synthesized compounds was evaluated, on albino rats. The present investigation deals with the synthesized compounds possessing good Analgesic activity.

**KEYWORDS:** Hydrazine, Benztriazole, Analgesic activity.

---

### Simultaneous Estimation of Azithromycin and Ambroxol Hydrochloride in Combined Tablet Dosage Form by Multicomponent Mode of Analysis

Pendharkar NA and Chaple DR.....296

---

#### ABSTRACT:

A simple, precise and accurate spectrophotometric method has been developed for simultaneous estimation of ambroxol hydrochloride and azithromycin in combined dosage form using multicomponent mode of analysis. It involves the measurements of absorbance at five selected wavelengths 215 nm, 258 nm, 260 nm, 300 nm and 307 nm using methanol and sodium hydroxide (0.2 N) as a solvent. Linearity was observed in the range of 10-80 µg/mL for mixture. The recovery studies confirmed the accuracy of the proposed method. The results were validated as per ICH guidelines.

**KEYWORDS:** Azithromycin, Ambroxol hydrochloride, Multicomponent mode

---

### HPTLC Estimation of Cefixime and Cloxacillin in Tablet Dosage Form

Smita J Pawar, Amol P Kale, Manoj P Amrutkar, Jyotsna J Jagade, Nikhil S Pore and Ashok V Bhosale.....299

---

#### ABSTRACT:

A simple, rapid, reliable and accurate HPTLC method has been developed for the quantitative determination of Cefixime and Cloxacillin in bulk and tablets. The drugs were extracted from (Zifi X 200). Various aliquots of this sample solution were spotted automatically by means of Camag (Muttenez; Switzerland) Linomat V sample applicator on Merck HPTLC plates (0.2mm thickness) precoated with silica gel 60 F<sub>254</sub> on aluminium sheet as stationary phase prewashed with methanol using n-Butanol: Methanol: Water: Formic acid (8:6:4:0.3v/v/v) as mobile phase. The spots were scanned at λ=293 and 343 nm for Cefixime and Cloxacillin respectively using Camag TLC scanner 3. The R<sub>f</sub> values of Cefixime and Cloxacillin were found to be 0.28 and 0.45 respectively. Calibration curves were linear in range of 150-600ng per spot. The limit of detection (LOD) and quantitation (LOQ) for Cefixime and Cloxacillin were found to be 50, 20 and 150, 60 ng per spot respectively. The suitability of this method for quantitative determination of compounds was proved by validation in accordance with requirements of pharmaceutical regulatory standards. The proposed method is valid, simple, sensitive and accurate. Therefore this method can be applied for routine analysis of these drugs in bulk and tablet formulation.

**KEYWORDS:** Cefixime, Cloxacillin, HPTLC, Pharmaceutical Tablet dosage form.

---

### Development and Validation of UV Spectrophotometric Methods of Loratadine in Bulk and Pharmaceutical Formulation

N Harikrishnan, Deepthi R, Manjusha V, P Satya Vani, MV Asha Jyothi, and C Roosewelt.....302

---

**ABSTRACT:**

A simple, accurate, cost effective and reproducible spectrophotometric method has been developed for the estimation of loratadine in bulk and pharmaceutical dosage form. UV spectrophotometric method, which is based on measurement of absorption at maximum wavelength 245nm. The percentage recovery of loratadine is 99% ranged from  $(99.97 \pm 0.3969)$  in pharmaceutical dosage form. The developed method was validated with respect to linearity, accuracy (recovery), precision and specificity. Beers law was obeyed in the concentration range of 5-30 $\mu$ g/ml having line equation  $y = 0.0043x + 0.01$  with correlation coefficient of 0.99868. Results of the analysis were validated statistically and by recovery study.

**KEYWORDS:** UV spectrophotometry, loratadine

---

**Synthesis and Biological Activity of 5-substituted and 5,6-disubstituted-2-(N, N-Dialkyl Thiocarbamido) Benzimidazoles**

*YS Rane, RR Varma, LS Patil, SV Athlekar, AS Chowdhary and AS Bobade.....305*

---

**ABSTRACT:**

Heterocyclic compounds such as 5-substituted and 5,6-disubstituted-2- (N, N-dialkyl Thiocarbamido) benzimidazoles were synthesized by condensation of 5-substituted and 5,6-disubstituted-2-mercapto benzimidazoles with N, N-dialkyl carbamoyl chlorides and triethyl amine in dry 1,4-dioxane. Synthesized compounds were further screened for their biological activity and found to have good to moderate antibacterial and antifungal activity. The structures of compounds have been established on basis of their elemental analysis and spectral data (IR and NMR).

**KEYWORDS:** Mercapto Benzimidazole, antifungal, antibacterial, N, N-dialkyl carbamoyl chloride

---

**Synthesis and Screening of Biphenyl ether derivatives for their Anti-inflammatory and Analgesic activity**

*HG Akkamma, BS Vikram, T Srinivas Rao and D Baggiya Selvi.....308*

---

**ABSTRACT:**

Nimesulide (Biphenyl Ether) derivatives were synthesized by four steps, Step-1- Ulmaan ether synthesis, Step-2- Reduction of NO<sub>2</sub>, Step-3- Condensation reaction, Step-4- Nitration and evaluated for their anti-inflammatory and analgesic activities.

The compounds have been characterized on the basis of preliminary methods, spectral data and tested for anti-inflammatory activity and compared with standard drug as per the standard drug rat hind paw edema method by using Plethesimograph and analgesic activity by Eddies-hotplate method. Among the derivatives prepared, few showed the moderate activity and few showed decreased activity.

**KEYWORDS:** Biphenyl ether derivatives, phenoxy methane sulphonamide derivatives, Non-steroidal anti-inflammatory and analgesic drugs.

---

**In Vitro Antioxidant Activity of the Methanolic Extract of *Simaruba glauca* DC**

*Jiby Elias, Rajesh MG, Anish NP, Deepa P and Jayan N.....312*

---

**ABSTRACT:**

The present investigation evaluates the *in vitro* antioxidant potential of the methanolic extract of *Simaruba glauca* (MESG). The reducing power of the extract increased with the increasing concentration which indicated that the plant has inherent antioxidant potential. MESG at 250  $\mu$ g/ml showed maximum scavenging activity of DPPH (83.87%) followed by hydroxyl (80.19%), superoxide (76.25%) and nitric oxide (70.43%) radicals. The half inhibition concentration (IC<sub>50</sub>) of DPPH, hydroxyl, superoxide, and nitric oxide radicals were 21 $\mu$ g/ml, 26 $\mu$ g/ml, 27 $\mu$ g/ml and 32 $\mu$ g/ml respectively against the corresponding reference standards. Phytochemical screening of MESG revealed the presence of alkaloids, flavanoids, sterol/ terpenoids, quinines, anthroquinones, glycoside, reducing sugar, carbohydrate, volatile oil and phenolic compounds. However, coumarins, saponins, tannins and resins were absent in the extract. The total phenolic content of MESG was 24.6mg/g. The findings suggest that MESG possesses potent antioxidant activity and has great importance in nutraceuticals and pharmaceutical preparations.

**KEYWORDS:** *Simaruba glauca*, DPPH, reducing power, phenol

---

**Development and Validation of UV Spectrophotometric Method of Glibenclamide (Glyburide) in Bulk and Pharmaceutical Formulation**

*N Harikrishnan, U Muralikrishna, Basha Shaik, Vishal Bhavsar, Manjusha V and V Ranjith Kumar.....316*

---

**ABSTRACT:**

The present research work discussed the development of a UV estimation method for glibenclamide. A simple, accurate, cost effective and reproducible spectrophotometric method has been developed for the estimation of Glibenclamide in bulk and pharmaceutical dosage form. UV spectrophotometric method, which is based on Measurement of absorption at maximum wavelength 242nm. The percentage recovery of Glibenclamide ranged from (99.97 ± 0.3969) in pharmaceutical dosage form. The developed method was validated with respect to linearity, accuracy (recovery), precision and specificity. Beers law was obeyed in the concentration range of 5-30µg/ml having line equation  $y = 0.0211x - 0.0114$  with correlation coefficient of 0.9934. Results of the analysis were validated statistically and by recovery study.

**KEYWORDS:** UV spectrophotometry, Glibenclamide

---

**Synthesis And Antimicrobial Activity of Some New 2,5-Disubstituted 1,3,4-Oxadiazoles**

*Prabhu C Jalihal, Suresh Sharabasappa and Basavaraj Kilarimath.....319*

---

**ABSTRACT:**

Ortho, meta and para-nitroaniline was treated with methyl methacrylate in the presence of acetic acid to get methyl 2-methyl-3-(o,m and p-nitroanilino)propionates which was further treated with hydrazine hydrate (99 %) in the presence of absolute ethanol to get 2-methyl-3-(o,m and p-nitroanilino) propanohydrazide. The above compound was then treated with carbon disulphide in the presence of alcoholic KOH and ethanol as a solvent to get 5-{1-methyl-2-(o,m and p-nitroanilino) ethyl}-1,3,4-oxadiazole-2-thiol. These compounds were further treated with morpholine / piperidine / diethyl amine/ dimethyl amine / diphenyl amine to get title compounds. The newly synthesized compounds were characterized by spectral and elemental analysis and the compounds were tested for antimicrobial activity.

**KEYWORDS:** Oxadiazole, propionates, propanohydrazide.

---

**Modern Periodic Table: Possible Proposed Position for Hydrogen**

*Rajesh Kumar Kalyandas Sharma.....324*

---

**ABSTRACT:**

Arrangement of elements according to scientific way is very essential for easy study of all elements. Modern periodic table is use for the study of elements. But in modern periodic table hydrogen element position is yet not specified. In modern periodic table hydrogen element takes three places. In present paper author is proposing one place of hydrogen element in the periodic table.

**KEYWORDS:** Arrangement of elements, giving one position to hydrogen element in periodic table.

---

**UV-Spectrophotometry Estimation of Fenofibrate in Tablet Dosage Form.**

*Vijay Jadhav, Chandrakant Raut and Pandurang N Dhabale.....326*

---

**ABSTRACT:**

A new, simple, specific, sensitive, accurate, precise and economical procedure for determination of Fenofibrate in their tablet dosage form has been developed using Zero order and Second Order Derivative Method. In the proposed method, the signals of absorbance maxima were measured at 285.5nm in methanol solvent. The method based on the native ultraviolet absorbance maxima. The drug obeyed Beer's law in the concentration range from 03-30 µg/ml in method. The results of analysis have been validated statistically and by recovery studies. The method shows good

repeatability and recovery with % RSD is less than 2. The precision and accuracy of method were confirmed by repeatability and by recovery studies.

**KEYWORDS:** Absorbance maxima, Fenofibrate, Derivative spectroscopy.

---

**Derivatized HPTLC Method for Simultaneous Estimation of Glucosamine, Vitamin C and Vitamin E in Tablets**

*WD Sam Solomon, Rahul A Kumar, PR Vijai Anand and R Venkatnarayanan.....329*

---

**ABSTRACT:**

An accurate, precise and derivatized HPTLC method has been developed for the simultaneous estimation of Glucosamine, Vitamin C and Vitamin E in tablet formulation. In this method standard and sample solutions of Glucosamine, Vitamin C and Vitamin E were applied on pre-coated silica gel 60F<sub>254</sub> TLC plate, and developed using ethanol: Acetic acid (9:1 v/v), as mobile phase and derivatized using Iodine vapor. The drugs on the plate were scanned at 500 nm. The dynamic linearity range was 20-100 µg/spot for Glucosamine, 2 - 10 µg/spot for Vitamin C and 0.2 - 1 µg/spot for Vitamin E. The method was validated for precision, accuracy and reproducibility.

**KEYWORDS:** Simultaneous estimation, HPTLC, Glucosamine, Vitamin C and Vitamin E.

---

**Synthesis and Anti-Inflammatory Activity of 2-Acetyl Thiophene**

*B. Ramesh B. Someswara Rao and S. V. Kulkarni.....332*

---

**ABSTRACT:**

Some new chalcones have been synthesised by the condensation of 2-acetyl thiophene with various aromatic aldehydes in 40% alkali. The synthesised compounds were identified by spectral data and screened for anti-inflammatory activity. Some of these compounds showed moderate to considerable anti-inflammatory activity.

**KEYWORDS:** Chalcone, Synthesis, Anti-inflammatory activity.

---

**Synthesis and Antimicrobial Activity of 5-Substituted-2-(1-H-Benzimidazole) Sulfonamides**

*YS Rane, RR Varma, LS Patil, SV Athlekar, AS Chowdhary and AS Bobade.....335*

---

**ABSTRACT:**

Heterocyclic compounds such as 5-substituted-2-(1-H-benzimidazole) sulfonamides were synthesized by condensation of 5-substituted-2-(1-H-benzimidazole)-sulfonyl chloride and 2-aminoheterocycles with triethyl amine in dry acetone. The synthesized compounds were checked for their antimicrobial potency by screening them against two bacterial strains as well as one fungal strain. The structures of compounds have been established on the basis of their elemental analysis and spectral data.

**KEYWORDS:** Sulphonamides, 2-mercapto benzimidazole, antifungal, antibacterial.

---

**UV-Spectrophotometric Estimation of Atorvastatin Calcium in Tablet Dosage Form.**

*Pandurang N Dhabale, Vijay Jadhav and Chandrakant Raut.....339*

---

**ABSTRACT:**

A new, simple, specific, sensitive, accurate, precise and economical procedure for determination of atorvastatin calcium in tablet dosage form has been developed using Zero order and Second Order Derivative Method. In the proposed method, the signals of absorbance maxima were measured at 247.5 nm. The method based on the native ultraviolet absorbance maxima. The drug obeyed Beer's law in the concentration range from 3µg/ml to 30 µg/ml. The results of analysis have been validated statistically and by recovery studies. The method shows good repeatability and recovery with % RSD is less than 2. The precision and accuracy of method were confirmed by repeatability and by recovery studies. These method have been successively applied to pharmaceutical formulation and were validated according to ICH guidelines.

**KEYWORDS:** absorbance maxima, atorvastatin calcium, Derivative spectroscopy.

---

### Synthesis and Antimicrobial Evaluation of Benzimidazole Analogs

YS Rane, RR Varma, LS Patil, SV Athlekar, AS Chowdhary and AS Bobade.....342

---

#### ABSTRACT:

A series of benzimidazole phenylthiocarbamoyl derivatives were synthesized by condensing substituted 2-mercaptobenzimidazole with substituted benzoyl chlorides. These benzimidazole derivatives were evaluated for their antibacterial activity against Gram Positive bacteria *Staphylococcus aureus* (ATCC 3750) and Gram Negative bacteria *Salmonella typhi* (NCTC 786), as well as antifungal activity against a fungal strain *Candida albicans* (ATCC 10231). It was observed that the 5-naphthoxy-6-chloro benzimidazole derivatives having dichloro substitutions on the phenylthiocarbamoyl part of the molecule showed better activity than the rest.

**KEYWORDS:** benzimidazole, antimicrobial, phenylthiocarbamoyl derivatives, benzoyl chloride

---

### Batch Biosorption Studies for the Removal of Chromium

Naren Kumar Kodumuri, P Shankar, D Sathis Kumar, T Rohit Reddy, P Vikram and K Swathi.....346

---

#### ABSTRACT:

Batch sorption experiments were carried out using a novel adsorbent, Acid treated *Pongamia* Leaf Powder (APLP) and Acid treated *Neem* Leaf Powder (ANLP), for the removal of Chromium(VI) from aqueous solutions. Potential of APLP and ANLP for adsorption of chromium from aqueous solution was found to be excellent. Effects of process parameters pH, contact time and adsorbent capacity were studied. Langmuir model represent the experimental data well. Maximum dye uptake was found indicating that APLP and ANLP can be used as an excellent low-cost adsorbent. Comparison of adsorption capacity of APLP and ANLP for chromium clearly indicates that the capacity of APLP for adsorption of chromium is quite high than ANLP. It can be expected that APLP and ANLP would have similar capacities for dyes with similar molecular weight, structure and/or ionic load. Thus, the naturally defoliated the *Pongamia* and *Neem* leaf powders a low-cost natural resource, can be effectively used to remove pollutants from effluents.

---

### Inhibition of Corrosion of Aluminium in 1N Sodium Hydroxide by Salicylic Acid in Conjunction with Calcium Acetate

K Rajalakshmi and T Jayendran.....351

---

#### ABSTRACT:

The effect of salicylic acid in conjunction with calcium acetate on the corrosion of aluminium in sodium hydroxide (1.0N) solution has been investigated using Polarisation Measurements, Open Circuit Potential Measurements, Gasometric Measurements and Weight Loss Studies. The inhibition efficiency values determined by these techniques, showed close agreement. The combination of salicylic acid and calcium acetate was found to show synergistic inhibition effect. The results collectively are in good agreement and show clearly that salicylic acid in conjunction with calcium acetate is a good corrosion inhibitor for aluminium under the conditions studied.

**KEYWORDS:** Salicylic acid in conjunction with calcium acetate, Sodium hydroxide solution, aluminum and corrosion inhibition

---

### Synthesis and Antimicrobial Activity of Some 3-Substituted -4H-1, 2, 4-Triazole Derivatives

Goyal P K, Bhandari A, Rana AC and Bele DS .....355

---

#### ABSTRACT:

Five new 3-substituted -4H-1, 2, 4- triazoles derivatives 4 (a-e) were synthesized by treatment of 4-alkyl diazo substituted 4H-1, 2,4- triazoles- 3-thiole with different aliphatic and aromatic amines to give the titled compounds. All the synthesized derivatives were characterized by spectral (UV, IR, 1H-NMR, MS) and elemental analysis. The in vitro antimicrobial activity of all the derivatives were evaluated against the pathogens, *S. aureus*, *B. subtilis*, *P. aeruginosa*, *E. coli*, *A. niger* and *C. albicans*. Some derivatives were found to possess very promising antimicrobial activity.

**KEYWORDS:** 4H-1, 2, 4-triazole, antimicrobial.

---

**Simultaneous Estimation of Mebendazole and Pyrental Pamoate by Absorption Ratio Method**

*AS Langde, RM Charde, MS Charde and MR Tajne.....359*

---

**ABSTRACT:**

Simple, sensitive and specific spectrophotometric method was developed and validated for quantitation of Mebendazole (MEB) and Pyrental Pamoate (PYR) in tablet dosage form. The new analytical method was developed based on the simultaneous estimation of drugs in a binary mixture without previous separation. In graphical absorption ratio method was performed by absorbance at 281.0nm and 311.6nm. Both the drugs MEB and PYR and its mixture follow beer-lambert's law in the range of 0-30 µg/mL at all the selected wavelengths. The percent estimation of mixed drugs in laboratory mixture was done to be 100.30±0.19 and 99.32±0.78 for MEB and PYR respectively. The percent drug estimation in marketed formulation was found to be 100.30±0.34 and 101.45±1.84. The average percent recovery was found to be 100.45±0.23 and 100.98±0.60. The results of the method lies within the prescribed limit of 98-102 % shows that method is free from interference from excipients.

---

**Simultaneous Estimation of Telmisartan and Pioglitazone in Pharmaceutical Dosage Form by RP-HPLC Method**

*Kamalakannan D, Vijay Amirtharaj R and Senthilkumar N,.....364*

---

**ABSTRACT:**

A simple, precise, accurate, rapid and reproducible RP-HPLC procedure was developed for simultaneous estimation of Telmisartan and Pioglitazone in pharmaceutical dosage form at a single wavelength. The mobile phase used was a combination of acetonitrile: 0.5% triethylamine (pH 4.5 with orthophosphoric acid) (65:35). The detection of the combined dosage form was carried out at 210 nm and flow rate set 1.3 ml/min. Linearity obtained in the concentration range of 10 to 50 µg/ml for Telmisartan and 7.5 to 37.5 µg/ml for Pioglitazone with correlation coefficient of 0.9997 and 0.9995 respectively. The result of analysis were validated statistically recovery studies confirmed by the accuracy of the proposed method.

---

**KEYWORDS:** Simultaneous Estimation by RP-HPLC, Telmisartan, Pioglitazone.

---

**Simultaneous RP-HPLC Method Development and Validation of Cefixime and Ofloxacin in Tablet Dosage Form**

*Prabhu S, Vijay Amirtharaj R and Senthilkumar N,.....367*

---

**ABSTRACT:**

A simple, precise, accurate, rapid and reproducible RP-HPLC procedure was developed for simultaneous determination of Cefixime and Ofloxacin in tablet dosage form at a single wavelength. The determination was carried out by using Phenomenox, Gemini C18, Column (50 x 4.6mm) with mobile phase used as a combination of acetonitrile : 0.05 M Tetra butyl ammonium Hydrogen Sulphate (pH 6.0 with orthophosphoric acid) (35:65). The detection of the combined dosage form was carried out at 290 nm and flow rate set 2.0 ml/min. Linearity obtained in the concentration range of 160 and 240 Cefixime and Ofloxacin with correlation coefficient of 0.9999 and 0.9999 respectively. The result of the analysis were validated statistically and recovery studies confirmed by the accuracy of the proposed method.

---

**KEYWORDS:** Cefixime, Ofloxacin and RP-HPLC.

---

**Computer Aided Docking Studies on Antiviral Drugs for Bird Flu**

*R Siva Kumar, Shaik Nafeez Basha, P Kumar Nallasivan, WD Sam Solomon and R Venkatnarayanan.....370*

---

**ABSTRACT:**

The Protein- Ligand interaction plays a significant role in structural based drug designing. The highly pathogenic influenza A virus subtype H5N1 virus is an emerging avian influenza virus that has been causing global concern as a potential pandemic threat. It is often referred to simply as "bird flu" or "avian influenza". In our research work we have taken influenza A virus H5N1 receptor. The receptor was docked to the commercially available drugs zanamivir and oseltamivir and the energy value obtained are as follows; zanamivir (-231.74) and oseltamivir (-

243.74) using the HEX docking software. We tried to improve the binding efficiency and steric compatibility of zanamivir against N5N1 receptor. Several modifications were made to the probable functional groups which were interacting with the receptor molecule. Analogs of this drug molecule were prepared using ACD ChemSketch and docked using HeX docking software. Zanamivir analog 3 and oseltamivir analog 5 were detected with significant energy values and probable lead molecules. The Modified drugs was sketched using Chems sketch were found to be better than the conventional drugs available. Further from this work we can improve the steric compatibility and then ADME properties of the Analogs can be analyzed using Inslico ADME tools available.

**KEYWORDS:** Bird flu, Chems sketch, Docking, Hex, Rasmol.

---

**Stability Indicating RP-LC Method for Determination of Eszopiclone in Bulk and Pharmaceutical Dosage Forms**

*R Narendra Kumar, G Nageswara Rao and PY Naidu.....374*

---

**ABSTRACT:**

An isocratic stability indicating liquid chromatographic method has been developed and validated for the determination of Eszopiclone in bulk drug and its pharmaceutical dosage form. Separation of the drug with degradation products was achieved using Peerless HT, C8, 50 x 4.6 mm; 1.8 µm column as stationary phase and pH 4.5(±0.05) buffer: Acetonitrile: Tetrahydrofuran (81:18:1,v/v) as mobile phase at a flow rate of 1.0 mL/min. UV detection was performed at 304 nm. The method is linear over the range of 10 - 150 µg/mL. The percent recovery of drug in dosage forms was ranged from 97.7 to 100.5. The method is simple, rapid, precise, selective and stability indicating and can be used for the assay in quality control and stability studies samples.

**KEYWORDS:** Bird flu, Chems sketch, Docking, Hex, Rasmol.

---

**Stability Indicating RRLC Method for Determination of Aripiprazole and Its Intermediates in Bulk and Pharmaceutical Formulation**

*GVH Raju, S Ganapathy, DG Sankar and PY Naidu.....380*

---

**ABSTRACT:**

An Rapid Resolution Liquid Chromatographic method (RRLC) has been developed and subsequently validated for the determination of Aripiprazole and its intermediates in bulk and pharmaceutical formulation. Separation was achieved with a Hypersil gold, C18, 50 x 4.6 mm, 5 µm column with Mixture of Potassium Dihydrogen Phosphate and Triethylamine (pH adjusted to 3.0±0.05 with Orthophosphoric acid):Acetonitrile : Methanol (60:20 :20,v/v) as eluent at a flow rate 1.0 ml/min. UV detection was performed at 252nm.The method is simple, rapid, selective and stability indicating .The described method is linear over a range of 30.507µg/mL to 183.040µg/mL.The method precision for the determination of assay was below 2.0% RSD .The Percentage recoveries of Active Pharmaceutical Ingredient(API) from dosage forms ranged from 97.4 to 100.2 for all available strengths of Arpiprazole in market. LOD and LOQ of all Related impurities of Aripiprazole was established and ranged from 0.015µg/ml - 0.034µg/ml for LOD and 0.04µg/ml - 0.101µg/ml for LOQ .The method is useful in the quality control of bulk manufacturing and also in pharmaceutical formulations.

---

**A Study on Particle Size Distribution Profile of Coal Combustion Residues from Thermal Power Plants of India**

*Sumit Mishra and Gurdeep Singh.....386*

---

**ABSTRACT:**

The present study describes the comparative assessment of Particle size distribution profiles of Coal Combustion Residues from two thermal power stations of Korba, Chattisgarh, India. Knowledge about Particle size is indispensable to determine the possibility of usage of these Coal Combustion Residues in various applications. Coal combustion Residues of CSEB-E power plants were found to have better particle size distribution profile than CSEB-W power plant. CSEB-E power plant had AMD from 15.83 to 66.91 and CSEB-W 49.48 to 75.36. The particle size analysis reveals that the samples which have the highest undersize percent by volume in the particle size range of <45 are useful as fillers in construction materials. They may also be used in geotechnical applications, bulk utilization through back filling, reclamation of waste degraded land and for stowing in underground mines.

**KEYWORDS:** Coal Combustion Residues (CCRs), Particle Size Distribution Profile (PSDP), Fly Ash (FA), Bottom Ash (BA), Pond Ash (PA)

---

**Redox Behavior and DNA Cleavage Studies of Copper (II) Schiff Base Complex Derived From 2-Aminobenzaldehyde**

*P Jayaseelan, S Prasad and R Rajavel.....389*

---

**ABSTRACT:**

The tetradentate Schiff base ligand was prepared by condensation of 2-aminobenzaldehyde with o-phenylenediamine. The synthesized complex has been studied by using cyclic voltammetry and DNA cleavage studies. The resulting voltammogram consists of a single quasi-reversible one electron transfer attribute to couple [Cu(II)L]/[Cu(I)L]. Trends in cathodic peak potential (E<sub>pc</sub>) values are observed which can be correlated with electron effects of Schiff base ligand, changes with basicity of liquid groups are determinant for electrochemical trends. The interaction of Cu(II) complex with Calf Thymus DNA has been studied by using absorption, viscosity and cyclic voltammetry. Cyclic voltammetry studies reveal that the complex prefer to bind to DNA in Cu(II) rather than(I) oxidation state.

**KEYWORDS:** Schiff base, Copper(II), 2-aminobenzaldehyde, Voltammetry, DNA Cleavage studies.

---

**A Sensitive and Selective GC-MS Method for the Determination of Process Related Genotoxic Impurities in Esomeprazole Magnesium**

*Yogeshwar Reddy M, Ramesh V, Kista Reddy Ch, Suryanarayana M.V, Dilip Kumar M, Raju G , Saravanan G and Debashish Datta.....395*

---

**ABSTRACT:**

A sensitive gas chromatography (GC)-mass spectrometry (MS) method is developed and validated for the determination of the residues *p*-Anisidine and 4-Methoxy-2-nitro aniline as genotoxic impurities in Esomeprazole magnesium drug substance.

**KEYWORDS:** GC-MS, Esomeprazole, Selected ion monitoring

---

**Analytical Method Development for Phenylpropanolamine Hydrochloride Sustained Release Pellets**

*Rakhee K Kotecha, Anand S Surana, AV Chandewar, PD Nakhat, and NP Jogad.....398*

---

**ABSTRACT:**

The main aim of the present study was to developed analytical method for phenylpropanolamine hydrochloride (PPH) in PPH sustained release pellets. Analysis of PPH i.e. assays and dissolution has been given in USP by HPLC method. No UV-Visible spectrometry method has been reported for the analysis of PPH. Analysis of PPH was carried out by using UV-Visible spectrometry after performing the part method validation of specificity (scanning the standard solution of PPH), filter paper validation and linearity. Sustained release pellets were fabricated containing PPH by solution/suspension layering technique. A solution of PPH was prepared in distilled water and UV spectrum was taken using Perkin Elmer, Lambda25- UV/Vis Spectrophotometer. Filter paper validation was done by filtering standard PPH solution (10ppm) through Whatman filter paper No. 41 and absorbances of filtered solution was taken repetitively and compared with unfiltered solution at 205 nm. There was negligible changed in absorbance was obtained. The data for calibration plot showed good linear graph with  $r^2 = 0.9980$  for PPH. According to international conference on harmonization (ICH) guidelines, the present method was validated for precision, repeatability and recovery.

**KEYWORDS:** UV-Visible spectrophotometer, phenylpropanolamine hydrochloride, Sustained Release Pellets.

---

**Synthesis and Spectral Studies of Zirconium (IV) Complexes with Ligands Containing N and S Donor Atoms**

*Mallikarjun S Yadawe and Sangamesh A Patil.....401*

---

**ABSTRACT:**

Complexes of Zr(IV) with Schiff bases of 3-substituted-4-amino-5-mercapto-1,2,4-triazole and glyoxal/biacetyl/denzil have been synthesized in methanol and characterized by analytical and spectral data. They have 1:1 stoichiometry. The IR observations suggest that, the Schiff bases have co-ordinated through azomethine nitrogen atoms. The PMR spectral observations support the IR inference. On the bases of this information, it is suggested that, Zr(IV) complexes exhibit coordination number of six.

---

#### **Development and Statistical Validation of UV Spectrophotometric Method for Estimation of Griseofulvin in Tablet Dosage Form.**

*PA Jadhav, CS Raut, JP Bidada, BB Buwa, PN Dhabale and SC Dhawale.....404*

---

##### **ABSTRACT:**

A new, simple, rapid and novel reproducible UV-spectrophotometer estimation method has been developed for estimation of griseofulvin in marketed formulation. The proposed method was successfully applied for the estimation of griseofulvin in commercial pharmaceutical preparation with Absorbance maxima at 263.5 nm. A Shimadzu 1700 UV- Visible spectrophotometer with 1cm matched quartz cells and acetone: ethanol: 0.1N HCl (1:1:8) solvents were employed in the method. Developed methods obeyed the Beer's law in the concentration range of 0.5-3.5 µg/ml and methods were validated statistically. The SD and Percentage recovery of the drug for the proposed method are given in method indicating no interference of the tablet excipients. The results of the tablet analysis were validated with respect to accuracy (recovery), linearity, limit of detection and limit of quantitation were found to be satisfactory.

**KEYWORDS:** Absorbance maxima, Area under curve (AUC), Griseofulvin, UV spectrophotometer

---

#### **Low-Level Determination of Residual 4-Bromo Methyl-2'-Cyanobiphenyl in Valsartan by Liquid Chromatography-Mass Spectrometry**

*Yogeshwar Reddy M, Ramesh V, Kista Reddy Ch, Venugopal N, Saravanan G, Suresh Y, Suryanarayana M, Debashish Datta and Raju B.....407*

---

##### **ABSTRACT:**

A Liquid chromatographic (LC) method using mass spectrometric (MS) detection was developed and validated for the trace analysis (ppm level) of 4-Bromo methyl-2'-Cyanobiphenyl in Valsartan drug substances. LC analysis of 4-Bromo methyl-2'-Cyanobiphenyl was done on Nucleosil C18 (100 mm x 4.6 mm, 3 µm) column and the mobile phase is in the ratio of 50:50:1 containing water, acetonitrile, and acetic acid. The flow rate was 1.0 mL min<sup>-1</sup> and the elution was monitored at 225 nm. The method was validated as per International Conference on Harmonization (ICH) guidelines. LC-MS is able to quantitate up to 1.0 ppm of 4-Bromo methyl-2'-cyanobiphenyl.

**KEYWORDS:** Liquid chromatography- mass spectrometry Valsartan

---

#### **Insilico Prodrug Designing of Some Matrix Metallo Proteinase Inhibitors Derived From Tanomastat**

*Y Rajendraprasad, M Bhagavan Raju, KK Rajasekhar and S Sowjanya.....411*

---

##### **ABSTRACT:**

The present work describes the insilico prodrug designing of Tanomastat, a matrix metalloproteinase inhibitor. Tanomastat was selected as a lead and a series of prodrug-like molecules derived from it were generated. The pharmacokinetic and toxicity profile of these prodrug-like molecules was obtained by using ADME and TOX boxes web version of pharma Algorithms and ACD labs Chem Sketch software version 12.0. All prodrug-like molecules were predicted to be lipophilic, less toxic with an enhanced protein binding and better therapeutic efficacy. In conclusion, ADME and Toxicity properties of these molecules suggest advantages over Tanomastat.

**KEYWORDS:** *Insilico* prodrug designing, Tanomastat, Matrix Metallo Proteinase Inhibitor (MMPI), Pharmacokinetic and Toxicity profile.

---

#### **QSAR Studies of Novel 1- and 8-Substituted-3-Furfuryl Xanthines: An Adenosine Receptor Antagonist**

*Prarthana V Rewatkar and Ganesh R Kokil.....416*

---

**ABSTRACT:**

Adenosine modulates many important physiological functions, that affect the cardiovascular, renal, immune and central nervous systems. The receptors modulate the activity of adenylate cyclase either by stimulation ( $A_{2A}$  and  $A_{2B}$ ) or inhibition ( $A_1$  and  $A_3$ ) of the activity. Quantitative structure activity relationship (QSAR) study for a series of 1- and 8- substituted xanthine derivatives as adenosine receptor ( $A_{2A}$  and  $A_{2B}$ ) antagonist was performed. The QSAR models were developed using series of compounds against  $A_{2A}$  and  $A_{2B}$  antagonistic activity. The statistical quality of QSAR models was assessed by statistical parameters  $r^2$ ,  $r^2_{cv}$  (cross validated  $r^2$ ) and  $r^2_{pred}$  (predictive  $r^2$ ).

**KEYWORDS:** Furylxanthine Derivatives, Adenosine Receptor, QSAR, Multiple linear Regressions

---

**Synthesis and Biological Activities of Some Benzothiazole Derivatives**

*Hunasnalkar Shivraj G, Shaikh Gazi, Patil SM and Surwase Ulhas S.....421*

---

**ABSTRACT:**

Substituted benzothiazoles have received considerable attention during last two decades as they are endowed with variety of biological activities and have wide range of therapeutic properties. A Literature survey indicates that benzothiazole derivatives possess different pharmacological and biological activities; which of most potent activity are anti-inflammatory and anti-bacterial activity. The starting product is 6-substituted-1, 3-benzothiazol-2-amine was prepared from 4- substituted anilines and potassium thiocyanate in one step. Substituted Benzothiazolyl-2-amines were reacted with chloroacetyl chloride to yield 2-chloro acetyl amino-6-substituted benzothiazoles, which were reacted with 2-mercaptobenzothiazole and 2-hydrazinobenzthiazole gave 2-(1,3-benzothiazol-2-yl thio)-*N*-(6-substituted-1,3-benzothiazol-2-yl) acetamides and 2-[2-(1,3-benzothiazol-2-yl)hydrazino]-*N*-(6-methyl-1,3-benzothiazol-2-yl) acetamides respectively. The synthesized compounds were characterized by elemental analysis and spectral data.

**KEYWORDS:** Benzothiazoles, Antibacterial, Antifungal.

---

**Synthesis and Characterization of Some Azo Compounds**

*Arshi Naqvi, Mohd. Shahnawaaz, Arikatla V Rao and Daya S Seth.....428*

---

**ABSTRACT:**

Azo group containing molecules are frequently found in privileged pharmacophores. Azo compounds are important dyeing compounds and have been found to be associated with a broad spectrum of bioactivities. The present work is directed towards the synthesis of some azo compounds i.e. Azo salicylaldehydes, Ethyl 2,3-di oxo butyrate-2-(substituted) phenyl hydrazone and 2,4-Di keto-3-(substituted phenyl azo) pentane.

**KEYWORDS:** Azo compounds, diazotization, Azo salicylaldehydes, Ethyl 2,3-di oxo butyrate-2-(substituted) phenyl hydrazone and 2,4-Di keto-3-(substituted phenyl azo) pentane.

---

**Synthesis and *In Vitro* Antibacterial Evaluations of Novel Amino-Pyrimidines**

*Md. Sarfraz Alam and Garima Avasthi.....430*

---

**ABSTRACT:**

A number of chalcones were synthesized by reacting 2-Acetyl Naphthalene, with Aryl substituted aldehydes in ethanolic NaOH, a Claisen-Schmidt condensation reaction. These chalcones were further reacted with guanidine nitrate in presence of ethanolic NaOH to obtain the amino pyrimidines. The synthesized compounds were characterized on the basis of physical, chemical and spectroscopic data and were tested for the antibacterial activity using cup plate method. Evaluation of the compounds revealed remarkable antibacterial activity. In particular, amino-pyrimidines were found to be the most effective against *Bacillus subtilis* and *Escherichia coli* bacterial strains.

**KEYWORDS:** Chalcones, 2-Aminopyrimidines, Antibacterial, Guanidine nitrate

---

***Crossandra infundibuliformis* Leaves as an Effective Inhibitor for Mild Steel Corrosion in 1 M HCl**

*SV Priya, R Saratha.....434*

---

**ABSTRACT:**

Corrosion inhibition of mild steel in 1 M HCl was investigated in the absence and presence of different concentrations of extract of *Crossandra infundibuliformis* leaves. Weight loss measurements and electrochemical studies were employed. The corrosion rate of mild steel and the inhibition efficiencies of the extract were calculated. The results obtained show that the extract solution of the plant could serve as an effective inhibitor for the corrosion of mild steel in HCl media. Inhibition was found to increase with increasing concentration of the plant extract. The inhibitive actions of plant extract are discussed on the basis of adsorption of stable complex at the mild steel surface. Theoretical fitting of different isotherms, Langmuir, Temkin, Freundlich, Frumkin, Flory-Huggins and the kinetic thermodynamic model were tested to clarify the nature of adsorption. Polarisation curves revealed that this inhibitor act as a mixed type inhibitor and the inhibition efficiency up to 97.41 % can be obtained. The surface analysis study confirms the corrosion of mild steel and its inhibition by the inhibitor.

**KEYWORDS:** Mild steel; Corrosion inhibitors; Adsorption isotherms; Inhibition efficiency.

---

**Kinetics of Substitution of Cis-Bis (Oxalato) Diaquochromate (III) With Glycine, DL-Alanine and DL-Phenylalanine in Acid Medium**

*Venkata Subba Rao Mushini, Ananta Ramam Veluri and Muralidhara Rao Volety*.....442

---

**ABSTRACT:**

The kinetics of interaction between amino acids such as Glycine, DL-alanine and DL-phenylalanine and cis-bis(oxalato)diaquochromate(III) has been studied spectrophotometrically as a function of [Glycine], [DL-alanine] and [DL-phenylalanine]. The effect of pH, temperature and substrate is also studied. The substrate exists predominantly as the diaquospecies and amino acids (Glycine, DL-alanine and DL-phenylalanine) as the zwitterion at the experimental conditions. The substitution reaction has been found to proceed via two steps: amino acid dependent and amino acid independent paths indicating that the substitution reaction occurs through Ia mechanism in the amino acid dependent path and the dissociative mechanism in the independent path, showing the higher reactivity of single ended oxalate complex.

**KEYWORDS:** Kinetics, Substitution, Cis-bis(oxalato)diaquochromate(III), amino acids.

---

**Stability Indicating Fast LC Method for Determination of Tadalafil and Its Intermediates in Bulk and Pharmaceutical Formulation**

*GVH Raju, S Ganapathy, DG Sankar and PY Naidu*.....447

---

**ABSTRACT:**

Fast LC method has been developed and subsequently validated for the determination of Tadalafil and its intermediates in bulk and pharmaceutical formulation. Separation was achieved in Gradient mode using Peerless HT gold, C18, 50 x 4.6 mm, 1.8 $\mu$ m column with mobile phase A containing Potassium Dihydrogen Phosphate buffer (pH adjusted to 3.0 $\pm$ 0.05 with Orthophosphoric acid) and mobile phase B containing Methanol 100% at different time intervals as eluent at a flow rate 0.8ml/min. UV detection was performed at 220nm. The method is simple, rapid, selective and stability indicating. The described method is linear over a range of 12.5748 $\mu$ g/mL to 76.4548 $\mu$ g/mL. The method precision for the determination of assay was below 2.0% RSD. The Percentage recoveries of Active Pharmaceutical Ingredient(API) from dosage forms ranged from 101.0 to 102.1 for all available strengths of Tadalafil in market. LOD and LOQ of all Related impurities of Tadalafil was established and ranged from 0.006 $\mu$ g/ml - 0.011 $\mu$ g/ml for LOD and 0.018 $\mu$ g/ml - 0.033 $\mu$ g/ml for LOQ. The method is useful in the quality control of bulk manufacturing and also in pharmaceutical formulations.

---

**Development and Validation of High Performance Liquid Chromatographic Method for Lactic Acid Determination in Cefuroxime Sodium**

*T. Kaleemullah, Hemant Kumar Sharma, Pradeep Rajput and Mansur Ahmed* .....454

---

**ABSTRACT:**

An accurate, sensitive and rapid high performance liquid chromatographic method has been developed and subsequently validated for the determination of Lactic acid in bulk manufacturing of Cefuroxime sodium. Separation

was achieved with 250mm x 4.6mm, 5µm particle size, ODS AQ column. The mobile was a gradient prepared by simple phosphate buffer, pH 2.8 ± 0.05 and methanol at a flow rate of 1.0ml min<sup>-1</sup>, UV detection was performed at 210nm. The method was validated to confirm selectivity, precision, linearity and accuracy as per ICH guideline <sup>1</sup>. Because of its speed and accuracy the detection limit and quantification limit ranging from 3.3 µg ml<sup>-1</sup> and 10.1 µg ml<sup>-1</sup> respectively. Repeatability is good, with a relative standard deviation of 0.8% to 1.2%. This simple, efficient methodology can be used for quality control bulk manufacturing as well as routine analysis.

**KEYWORDS:** HPLC, Lactic acid, Cefuroxime sodium, Validation and development

---

**Modifying Effects of Mosinone-A on Glycoconjugates Levels in 7, 12-Dimethyl benz(a)anthracene Induced Hamster Buccal Pouch Carcinogenesis**

*G Sugunadevi, K Suresh, S Manoharan, MA Vijaya and K Rajalingam.....459*

---

**ABSTRACT:**

The present study was designed to investigate the modifying effects of Mosinone-A on glycoconjugates (protein bound hexose, hexosamine, total sialic acid and fucose) levels in 7,12-dimethylbenz(a)anthracene (DMBA) induced hamster buccal pouch carcinogenesis 0.5% DMBA painting (three times per week) in hamster buccal pouches for 14 weeks resulted in the formation of well developed oral squamous cell carcinoma. We observed 100% tumor formation with marked abnormalities of glycoconjugates status in tumor bearing hamsters as compared to control animals. Oral administration of Mosinone-A at a dose of 2mg/kg body weight, to DMBA painted hamsters on alternate days for 14 weeks, reduced the tumor formation as well as protected the levels of cell surface glycoconjugates in DMBA painted hamsters. The present study thus suggests that Mosinone-A has potent chemopreventive efficacy as well as protected the abnormalities on cell surface glycoconjugates during DMBA induced hamster buccal pouch carcinogenesis

**KEYWORDS:** Oral cancer, DMBA, Mosinone-A, Glycoconjugates

---

**New Spectrophotometric Method Applied to the Simultaneous Determination of Metoprolol Succinate and Hydrochlorthiazide**

*T Venkatachalam, V Kishor Kumar, P Kalai Selvi, R Srinivasan, R Mariammal, KG Lalitha.....464*

---

**ABSTRACT:**

Simple, sensitive, and specific spectrophotometric methods were developed and validated for quantitation of Metoprolol succinate and Hydrochlorthiazide in tablet dosage form. A new analytical method was developed based on the simultaneous estimation of drugs in a binary mixture without previous separation. In simultaneous equation method, Metoprolol succinate and Hydrochlorthiazide were determined by using their absorptivity values at wavelength maxima, viz., 222 nm and 272 nm. The standard deviation value for the different validation parameters was found to be between 0.094 and 1.01 for simultaneous equation method. This method is simple, accurate, rapid, and they require no preliminary separation and can therefore be used for routine analysis of both drugs in quality control laboratories.

**KEYWORDS:** Spectrophotometric, Metoprolol succinate, Hydrochlorthiazide, simultaneous equation method

---

**Synthesis and Study of Some New 2-Imino-3-[Carboxamido o-hydroxyphenyl]-5-Arylidene-4-Thiazolidinone as Antibacterial Agents**

*Patel VI, Patel RG, Patel NG, Panchal SR and Bhardia PD.....468*

---

**ABSTRACT:**

Some New 2-Imino-3-[Carboxamido o-hydroxy Phenyl]-5-Arylidene-4-Thiazolidinone, unsubstituted or carrying hydroxy, nitro and chloro groups on the benzene ring, were synthesized and assayed in vitro for their antibacterial activity against Gram positive and Gram negative bacteria by the cup-plate method . The 5-arylidene derivatives showed an antibacterial efficacy considerably greater than that of the parent 2-imino-3-(carboxamido p-hydroxyphenyl)-thiazolidine-4-one, suggesting that the substituted and unsubstituted 5-arylidene moiety plays an important role in enhancing the antibacterial properties of this class of compounds. All the title compounds characterised on the basis of their IR, MASS, <sup>1</sup>H NMR spectroscopic data analysis. The synthesized compounds

were screened for their in vitro antibacterial activity against *Staphylococcus aureus*, *B. citrus*, *Escherichia coli*, by measuring the zone of inhibition in mm. The antibacterial activity was performed by cup plate method at concentration 20µg/ml and 50µg/ml and reported. Nutrient agar was employed as culture medium and DMF was used as solvent control. Streptomycin used as standard for antibacterial activity. From the antibacterial screening it was observed that all the compounds exhibited activity against all the organisms employed. Compound bearing -2ClC<sub>6</sub>H<sub>4</sub>, -4ClC<sub>6</sub>H<sub>4</sub> substituents shows better anti bacterial activity than other compounds.

**KEYWORDS:** 2-imino-3-(carboxamido o-hydroxyphenyl)-thiazolidine-4-one; Thiazolidinone derivatives; Antibacterial activity.

---

**The Performance of VCI Coated Paper for Corrosion Prevention of Copper in HCl Environment**  
*N Poongothai, T Ramachanderen, M Natesan and SC Murugavel.....472*

---

**ABSTRACT:**

The performance of five essential oils has been used to study the corrosion prevention of copper by weight loss and electrochemical polarization methods. Results showed that the inhibition efficiency depends upon the concentration of inhibitors as well as that of acid. The essential oils reduce the corrosion of copper in HCl environment more effectively in 4% concentration. This is due to adsorption of inhibitor molecules on metal surface, which is proved by Tempkin adsorption isotherm. The electrochemical polarization result revealed that inhibitors are of mixed type in nature.

**KEYWORDS:** Copper, Inhibition efficiency, Adsorption.

---

**Bioanalytical Method Development and Validation of Esomeprazole in Human Plasma by LCMS/MS**  
*Sathiyaraj M, Vijay Amirtharaj R and Senthilkumar N.....477*

---

**ABSTRACT:**

A sensitive liquid chromatography - electro spray ionization mass spectrometry (LC-ESI-MS) method is developed and validated for rapid determination of Esomeprazole in human plasma. Rabepazole was used as the internal standard (I.S). Human plasma (80 µl) was first alkalified with 200 ml of sodium bi carbonate (100 mM) and then extracted with 2 ml of Ethyl acetate by vibromax shaker for 15min. The mixture was centrifuged at 4000 rpm for 15 mins. The supernatant was evaporated to dryness and the residue was reconstituted with water: 0.02% Diethylamine in methanol (3:7 v/v). Samples were separated by using a Gemini C<sub>18</sub> reversed phased column (50mm X 4.6mm I.D, 5µ). Mobile phase consisted of Acetonitrile : water (pH: 7.0 with Ammonia) [8:2 v/v]. Esomeprazole and internal standard were measured by electrospray ion source in positive selective ion monitoring mode. The good linearity ranged from 5 ng/ml to 1000 ng/ml and the lowest limit of quantification was 5 ng/ml. The extraction efficiency was approximately 73.4%. The quality control samples were stable when kept at room temperature for 6 hours, -70°C for 29 days and after three freeze- thaw cycles.

**KEYWORDS:** Esomeprazole, Rabepazole, LCMS/MS

---

**RP-HPLC Method for Simultaneous Estimation of Atorvastatin Calcium Ezetimibe in Pharmaceutical Formulation.**  
*MB Mundlik, CK Gadewar, NA Chandekar, NM Mahajan, PD Telgote and AV Chandewar.....485*

---

**ABSTRACT:**

A simple, selective, rapid and precise reverse phase HPLC method has been developed for the simultaneous estimation of Atorvastatin calcium and Ezetimibe in pharmaceutical dosage form. A Hypersil BDS (250 mm X 4.6mm i.d 5µ) column was used for Separation. The mobile phase was Acetonitrile: water: Methanol (350:550:100, v/v) and adjust Ph to 4.0 with Orthophosphoric acid. Flow rate 2.0ml/min with detection at 250nm. The retention time of Atorvastatin calcium and Ezetimibe was 21.712 and 10.414 min. respectively. The developed method was validated in terms of accuracy, precision, Linearity, specificity and forced degradation, robustness, solution stability, system suitability, limit of detection. The proposed method can be used for these drugs in combined dosage forms. The proposed RP-HPLC Method for the simultaneous estimation of Atorvastatin calcium and Ezetimibe in combined dosage form is accurate, precise, linear, rugged, robust, simple, rapid and selective. It can be easily

adopted for routine quality control (QC) analysis of raw materials, formulation studies. pH of the mobile phase is 4, which is good to increase the shelf life of the column.

**KEYWORDS:** RP-HPLC; Atorvastatin calcium, Ezetimibe.

---

### Synthetic Approach for the Novel Semicarbazones of Quinazoline ring and its Biological Activity

Ponnilarvarasan I, Rajasekaran A, Sivakumar KK, Sundaramoorthi C, Swastika Ganguly and Sivasakthi R.....491

---

#### ABSTRACT:

A number of organic compounds obtained by chemical synthesis as model compounds have useful antimicrobial activities. Quinazoline ring is an aromatic benzopyrimidine system; many of its derivatives possess interesting biological activities, such as analgesic, anti-inflammatory, anti-microbial, and anti-tumor. In our study, the biological activity of synthesized quinazoline semicarbazone derivatives were characterized by antimicrobial screening against several gram-positive, gram negative bacteria, and fungus. The purity of the synthesized compounds was characterized by physicochemical properties, such as solubility, melting point, and thin layer chromatography (TLC). Elemental analysis for carbon, nitrogen, hydrogen, and oxygen was performed according to standard procedures. The presence of functional groups was analyzed using FT-IR spectra. Molecular structural information for the compounds was analyzed by <sup>1</sup>H-NMR spectroscopy. The wavelengths of maximum absorbance for all the synthesized compounds were measured by UV-Visible spectroscopy. Thereby the chemical structures of the synthesized quinazoline derivatives were confirmed. Antimicrobial screening for all the compounds exhibits characteristic microbial inhibition. A detailed study is in progress to modify the synthetic route, structural activity, and toxicological barriers for the enhanced pharmacological efficiency of synthetic antibiotics.

**KEYWORDS:** Antimicrobial activity, Quinazoline semicarbazone, Biological, Synthetic antibiotics

---

### Synthesis of Some 1 - [Bis - N, N - (2 - Chloroethyl) Aminoacetyl] - 3, 5-Disubstituted -1, 2 - Pyrazolines as Possible Alkylating Anticancer Agents.

V Murugan, S Revathi, K Sumathi, Geetha KM and Kalpana Divekar.....496

---

#### ABSTRACT:

A series of 1 - [Bis - N, N- (2- Chloroethyl) aminoacetyl] -3,5 - disubstituted -1,2 pyrazolines have been synthesized by the treatment of 1 - [Bis - N, N - (2-hydroxyethyl) aminoacetyl] - 3,5 - disubstituted -1,2-pyrazolines with Phosphorous oxychloride, the starting compound pyrazoline was synthesized from various aldehydes and acetophenones. The synthesized compounds have been characterized by their analytical, IR, <sup>1</sup>H-NMR and mass spectral data. The titled compounds were investigated for their possible anticancer activities by *in vitro* and *in vivo* methods. These compounds were found to exhibit a moderate anticancer activity when compared to cyclophosphamide employed as a reference drug for comparison.

**KEYWORDS:** Synthesis; pyrazoline derivatives; anticancer activity; Dalton's Lymphoma Ascite (DLA) cell line.

---

### Photodegradation Kinetic Study of Aceclofenac by HPTLC Method

Nilesh Patel, Shailesh Shah, Ishwarsinh Rathod, Dhaval Patel and Biraju Patel.....500

---

#### ABSTRACT:

A simple, specific and precise HPTLC method was developed and validated for estimation of aceclofenac in photodegraded sample. The method involves separation of sample and photodegradation product on TLC aluminum sheets pre-coated with silica gel 60 F<sub>254</sub> plate using a mixture of Toluene: Ethyl acetate: Glacial acetic acid: Methanol (6.00:1.00:0.20:0.15 v/v/v/v) as the mobile phase. Detection of the spot was carried out at 284nm in absorbance/reflectance mode. The retardation factor (R<sub>f</sub>) for aceclofenac was found to be 0.35±0.03. The linearity range was found to be 50-150ng/spot with r<sup>2</sup>= 0.9931. The validated method was applied for determination of photodegradation kinetic study. Photodegradation reaction at various experimental conditions follows zero order kinetic and rate constant (K) was determined to be 0.4855 ng μl<sup>-1</sup> min<sup>-1</sup>. T<sub>1/2</sub> and T<sub>90%</sub> was found to be 116.78 min<sup>-1</sup> and 23.35 min<sup>-1</sup> respectively.

**KEYWORDS:** Photodegradation kinetics, Aceclofenac, HPTLC, Photostability.

---

**Analgesic and Anti-inflammatory Activity of Some 2-Iodo-N'-[(1E)-Substituted Phenylmethylidene] Benzohydrazide Analogues**

*Harer Sunil L, Rajurkar Vikas G, Kardile Nitin and Harer Priyanka S.....504*

---

**ABSTRACT:**

In the present study, eight compounds of phenylmethylidene benzohydrazide derivatives of *o*-iodo benzoic acid were synthesized by reacting 2-iodo benzohydrazide (1) with appropriately substituted aromatic aldehyde in glacial acetic acid yielded corresponding 2-Iodo-N'-[(1E)-Substituted Phenylmethylidene] Benzohydrazides (2). Structures of all the compounds (2) were established on the basis of elemental analysis and spectral data. These compounds were screened for analgesic activity by using Writhing test and Tail immersion method while Anti-inflammatory activity by rat paw edema method. Some of derivatives amongst them were showed significant activity against relative standards used for respective animal model.

**KEYWORDS:** Phenylmethylidene benzohydrazide, *o*-iodo benzoic acid, Analgesic, Anti-inflammatory activity

---

**Synthesis and In Vitro Antifungal and Anthelmintic Activity Studies of Some Substituted Aryloxy-4-Thiazolidinones**

*T Srinivas Rao, HG Akkamma and BS Vikram .....508*

---

**ABSTRACT:**

The results have shown that the Aryloxy-4-thiazolidinone derivatives are found to be effective anti-bacterial agents. The synthesized compounds were elucidated by spectral data. By analysis of IR, NMR and MASS spectral data the compounds reveals the successful information of Aryloxy-4-thiazolidinone derivatives. The synthesized compounds were screened for their anti-bacterial activities by using standard as ampicilin and are found to be effective chemotherapeutic agent. The synthesis of Thiazolidinones by the described methods resulted in the products with good yield.

**KEYWORDS:** Aryl oxy ethyl acetate, Schiff bases, Aryl oxy acethydrazide, ethyl chloroacetate, phenol.

---

**Use of Safranin-O in Photocatalytic Reduction of Carbonate Ions**

*Anil Ameta, Jyoti Bharadwaj and Aruna Ameta .....513*

---

**ABSTRACT:**

Photochemical reduction of sodium carbonate was investigated in presence of safranin-O. The progress of the reaction was observed spectrophotometrically at  $\lambda_{max} = 410 \text{ m}$ . The effect of pH variation on the formation of formaldehyde and formic acid was investigated. Where two maxima were observed i.e. pH = 6.0 and 10.0. Effect of various other parameters like concentration of carbonate intensity of light etc. The rate of photocatalytic reduction was also studied.

**KEYWORDS:** Photochemical reduction, Carbonate, Safranin-O, Formaldehyde, Formic acid.

---

---

**ADMINISTRATIVE, EDITORIAL, ADVERTISING AND SUBSCRIPTION OFFICE**

Asian Journal of Research in Chemistry, E-282 'Saikripa' Sector-4, Pt. Deendayal Upadhyay Nagar,

Raipur 492010. (CG) India Phone No. +919406051618. E. mail: editor.ajrc@gmail.com

Website: www.ajrconline.org